S
Insect Control
Colorado

REPORT

on the

INSECT CONTROL PROJECT

1927

COLORADO NATIONAL FOREST

July 11, 1927

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REPORT ON THE 1927 PROJECT

COLORADO NATIONAL FOREST

The purpose of this project was to stamp out if possible the Black Hills Beetle epidemic on the Colorado National Forest. With this in mind the control measures were concentrated in the larger centers of infestation.

History:

During the summer of 1926 an alarming rate of increase of the Dendroctorus ponderosae beetle in the yellow pine region of the Estes Park Ranger District was noticed. In December 1926 Junior Entomologist Persons of the Bureau of Entomology made an examination of some of the centers of infestation. On the basis of his report Congress was asked to appropriate $11,500 for control work. This was included in the Second Deficiency Bill which failed of passage by March 4, 1927.

During March it was found possible to reallot $4,100 from various D-2 allotments to insect control work. This was definitely allotted on March 30. On April 23 District 1 transferred $6,000 from their insect control funds. On June 15 a further increase of $1,200 was made making the total amount $11,450. Of this, $150 was used in defraying Mr. Persons' travel last December so the actual amount was $11,300 for control work. Following are the dates and amounts of the allotments for the work.

March 30, 1927	G.E.F.S. D-2 Special	$4100.
April 23, 1927	G.E.F.S. 1927 F. F.	6150.
June 15, 1927	G.E.F.S. D-2 Special	1100.
June 17, 1927	G.E.F.S. 1927 F. F.	100.
	Total allotted	$11,450.

With the above in mind it is easy to realize the unsettled status of the project until early in April, 1927. Definite plans were under way and decided by the first day of May and actual control work commenced on the third day of May.

ORGANIZATION

Supervision & Spotting:

It cost 33 cents to supervise and spot each tree treated.

At the commencement of the project there were three Forest Officers detailed to the work. They acted as spotters and supervised the actual work of two or three control crews.

The spotting was done by actually cruising the timber 100% and watching for indications of the Beetles in a tree. During May and early June the only indications on 80% of the trees were the pitch tubes at the entrance holes on the bark. Usually one or two old trees were located in each group whose color assisted materially in spotting.

It was found that not until the middle of June had the infested trees turned enough to materially aid the spotters.

The spotter on locating an infested tree would measure the diameter and estimate the number of eight-foot logs. He would then tag the same with a 4 x 4 inch square white tag giving it a number, showing the diameter and a blank place for the crew foreman to enter the length treated. He also entered the above data in his notebook.

The 4 x 4 tags were made from white sign painters muslin. These proved very effective as they could be seen easily and were large enough to place the tree number, diameter and length treated on them with marking crayon.

On account of rain washing the chalk filling from the tags the spotters found it inadvisable to spot more than two or three days in advance of the control crews.

Each spotter had direct supervision over two or three control crews of three men each. As he did the spotting it was easy to direct the crew foreman where to go when one group of trees had been treated. Each day the spotter spent a certain amount of time with each crew. It was found that where the spotter visited each crew once or twice daily better results were obtained by increased output.

The general supervision of the project was in charge of Forest Examiner Nelson. It was his plan to visit each layout, if possible, at least once a week spending as much time as necessary with each spotter to get first-hand knowledge of how the work was progressing and check the completed work and line out new areas. Travel between camps was by Ford truck; extra tools and other equipment were carried along to replenish the spotters needs at each stop.

At the close of the project two Forest Rangers, Junior Forester, Forest Examiner and three temporary employees were in charge of spotting with two or three control crews each. Control crews under each spotter were increased or decreased in number as the nature of the country and number of trees warranted. It was found that one spotter could handle three crews efficiently where the infested trees were well grouped and where more scattered two crews kept the spotter busy with his spotting and supervision of the work. Another factor which had a small influence also was the accommodations of the boarding places.

Control Work:

A control crew consisted of three men, one of whom was the foreman. They were furnished with one saw, two axes and one spudder and miscellaneous tools (files, etc.). The usual method was to first peel the bark on the tree to about 4 feet above ground. Then two men felled the tree. One man did the lopping of the top while the other two peeled the bark. Before the tree had been completely treated another tree was being felled so there was no lost time. Where trees were very limby one man could peel the bark from the infested portion almost as quickly as it took the other two men to trim the limbs.

The bark was peeled from the infested portion of the tree. The length treated varied; sometimes only 5 to 10 feet needed peeling while in other cases the entire length of the tree was infected and required peeling. The minimum length treated on any tree was five feet and the maximum length treated was one hundred and twenty-four feet. The average tree treated was 11 inches D. B. H. and 22 feet of length actually treated.

In a number of cases, especially in the Cedar park area, the woodpeckers had done considerable work on some of the infested trees. These trees showed a great deal of drying out of the larvae and it was determined that by peeling the tree standing to a six or eight feet height 90% or better of the brood was destroyed. This practice was approved and encouraged by Dr. M. W. Blackman of the Bureau of Entomology. Approximately 600 of the trees treated were done in this manner.

Stumps were cut at 12 inches or less from the ground and in the majority of cases were not peeled. This was found to be unnecessary labor as most stumps had very little brood. This practice was recommended by Dr. M. W. Blackman.

SUMMARY OF WORK DONE
Government Funds

Man Days	No. Trees Treated			Per Man Day
	Cut and Peeled	Peeled Standing	Total	
1935½	8032	600	8632	4.4
	Cooperative Funds			
28	110	3	113	4.0
	Total			
1963½	8142	603	8745	4.4

Equipment:

For each camp of six men and one spotter the following equipment was found necessary:

7 Axes, Double Bits preferred.
2 or 4 Bark spudders.
2 Saws, two-man. One extra saw in camp is very desirable for replacement purposes and use while reconditioning of those in use.
2 Pocket carborundum axe stones.
1 Saw set.
1 Niagara or Pike grinder.
6 12-inch flat Mill Bastard files.
6 8-inch flat mill files.
6 8-inch triangular files.
1 gallon can of coal oil.
2 Bottles for coal oil.
1 or 2 Lanterns.
2 Wash basins.
2 Canthooks.
4 2½-gallon canvas water bags.
1 First aid assortment.
1 14x16 tent.
1 7x9 tent.
1 Camp stove.

For Spotters Use:

1 Camp hand ax (Marbles Camp Axe #10) and sheath.
1 Compass.
1 Canvas carrying case or similar article for forms, Etc.
1 Pair Binoculars.
A supply of forms, paper, pencils, marking crayon, tags, time slips, maps and envelopes.
2 Note books, Form 289.
1 Set of Instructions.
4 to 8 pounds of sign posters tacks.
1 Diameter tape.
List of Designated Compensation Commissioner Physicians in nearby towns.
1 Claw hammer and nails.

In case the camp is a Government mess camp, cooking utensils, cook and mess tents and cook stove becomes necessary.

All purchases were made thru the District purchasing agent in Denver except a few small items needed at once.

Labor:

Good laborers were easy to get and no time was lost in weeding out the undesirables who would not push the work or else were unfit for the strenuous physical labor involved.

A wage of $3.00 a day and board or $4.00 a day without board was the standard wage paid for laborers. This was decided upon after considering all the local conditions and the nature of the work. This scale was lower than the local labor was receiving but considerable unemployment in the valley towns made the labor problem simple and there was no trouble in getting good men from the start.

The best man of each control crew was appointed as crew foreman and paid 25 cents more per day. He kept the tree record and was responsible to the spotter. He also made out the daily report each evening. A good foreman understood the beetle work, was a good axman and pushed the work.

The temporary men who were appointed as spotters were well qualified and worth the $4.00 per day and board for their services. Three men were used in this capacity and the last week it was necessary to use a fourth man. These men did good work, handled their men well and planned their work with some assistance. They required more supervision and time from the Forest Officer in charge of the project than the Forest Officers in charge of spotting. This was expected and taken into consideration.

Qualified men for this duty are scarce and next year it would be well to plan for assignment of Forest Officers as spotters as well as the three temporary employees developed this year.

Area Covered:

For exact location see the map attached to this report.

Approximately 32,000 acres were intensively covered and at least 99% of the infested trees treated. This would indicate an average of 175 trees treated per section.

Following is a list of control areas and the number of trees treated in each:

1.	Lakewood - - - - - - - - - - - - -	292
2.	Sugarloaf - - - - - - - - - - - -	285
3.	Middle & Dry St. Vrain - - - - -	1210
4.	Muggins Gulch and North St. Vrain - - - - - - - - -	1293
5.	Crozier Mt. and Big Thompson (Forks) - - - - - -	1907
6.	Glen Haven (113 trees under coop. agreement)	668
7.	Cedar Park - - - - - - - - - - -	1480
8.	Storm Mountain - - - - - - - - -	1610
	Total trees treated - - - - -	8745

Cooperation:

On account of the great amount of private land along the streams the control operations were mostly in the back country where the land was mostly government owned. To get the owners of the land along the streams to treat their infested trees required considerable interviewing and educational work. This was rewarded in most cases by action on the part of the local people and a rough estimate placed the number of trees treated by private individuals at 650 trees. Besides these, two parties deposited money in the Cooperative Work fund and the Government crews treated the trees found on their land. One had 17 trees and the other 96 trees treated. These are included in the summary ~~attached hereto.~~ shown on page 3.

On the Livermore Ranger district Ranger Ware was successful in getting private individuals at Cherokee Park to treat a group of 27 trees and he treated 4 on nearby Government land.

On the Poudre district Ranger Payson was able to have 150 trees treated without any cost except time spent in marking the trees to be treated.

All in all at least 1000 trees were treated by private interests besides the 8745 treated by the Government crews.

Location of Camps:

Wherever possible in locating camps advantage was taken of ranchers, local hotels, and resorts for boarding the men. It was felt that this method would cost no more than Government subsisted camps. In actual practice the advantages of boarding the men at local establishments far offset any difference in costs if any. This practice cut hauling and purchases during the project to a minimum. If Government mess had been installed at each of the camps extra tentage and mess equipment would have been necessary. It also reduced the amount of supervision to a minimum.

1. Lakewood and Sugarloaf Areas:

Headquarters were at Nederland where 2 of the laborers were boarded at the McKenzie Hotel at $1.50 per day. The other 4 men ~~were~~ boarded at their respective homes.

2. Middle and Dry St. Vrain Area:

Ten men including the spotter boarded at the resort called Riverside. Board was at the rate of 50¢ per man meal.

3. Muggins Gulch and No. St. Vrain Area:

Two camps, one of 4 and one of 9 men, were located along the North St. Vrain road. These men maintained their own mess and were paid at the rate of $4.00 per day.

4. Crozier Mountain and Big Thompson Area:

Six to twenty-one men were boarded at the Forks Hotel at Drake, Colorado. From one to three spotters worked out of here. Meals were 50¢ per man.

5. Glen Haven Area:

One spotter and six men were boarded at the Glen Haven store. Meals were at the rate of 50¢ per meal.

6. Cedar Park Area:

For six weeks 10 men including the spotter were boarded at Fred Hyatt's ranch. Mrs. Hyatt furnished good meals at 50¢ per meal.

7. Storm Mountain Area:

From May 3 to June 2, seven men including the spotter boarded at a small sawmill camp. Meals were charged for at the rate of 50 cents. From June 2 to June 25 the men were moved to a Government subsisted camp.

F I N A N C I A L S T A T E M E N T

Funds Available:

Total Insect Funds Available	$11,450.00
Total Contributed Salaries	1,573.31
Total Available for Project	$13,023.31

Expenditures:

Examination & Report:

Jr. Entomologist H. L. Person, Travel	$150.00

General Supervision:

Contributed Salary	$446.65	
Travel Expenses	137.85	
Gas & Oil Gov. Truck	50.00	
Total General Supervision		$634.50

Crew Supervision & Spotting:

Contributed Salaries	$1126.66	
Travel & Subsistence (F.S.)	412.93	
Wages Temporary Employees	491.50	
Subsistence	204.00	
Total Spotting, etc.		$2,235.09

Labor:

Wages paid	$6,439.95

Subsistence:

Labor subsistence	$2,312.99

Supplies & Equipment:

Ford truck & Accessories	$541.38	
General Equipment	322.36	
Total Equipment		$863.74

Hauling:

Freight, Express and Drayage Transportation of Laborers, etc.	$309.65

Miscellaneous:

Sharpening Equipment, etc.	$47.95	
Ranger Ware's travel and Supervision of Cherokee Park	15.33	
Ranger Payson, travel	3.50	
Total miscellaneous		$66.78
Total Expenditures		$13,012.68

Balance on Hand July 1, 1927 $10.63

Cooperative Work Fund:

Deposits:

Dr. Maitland	$200.00
Ruth E. Ashton	30.00
Total	$230.00

Expenditures:

Ruth Ashton (17 trees treated)		$30.00
Labor	$18.50	
Subsistence	10.50	
Hauling	1.00	
Total spent		$30.00
Balance on Hand July 1, 1927		$200.00

Dr. Maitland (96 trees treated)		$200.00
Labor	$76.00	
Subsistence	35.00	
Hauling	.80	
Total spent		$111.80
Balance on Hand July 3, 1927		$88.20

I recommend that the above balance be refunded to Dr. Maitland.

Distribution of Costs Tree Basis:

8632 trees treated (Average 11" D. B. H., 22' length.)

Item		Cost per tree
Examination & Report	($150.00)	$0.018
General Supervision	($634.50)	0.073
Crew Supervision and Spotting	($2235.09)	0.259
Labor	($6439.95)	0.746
Subsistence	($2312.99)	0.268
Supplies & Equipment	($863.74)	0.100
Hauling	($309.63)	0.036
Miscellaneous	($66.78)	0.008
Total cost per tree		$1.508

Total Cost-$13,012.68
Total trees treated--8632
Average cost per tree equals--$1.508

Cooperative Work Fund:

Ashton $30 cost and 17 trees treated gave a cost per tree of $1.77.

Maitland $111.80 cost of treating 96 trees gives a cost per tree of $1.165

The costs on Miss Ashton's land were a little high due to the scattered trees treated. Maitland's are low as the trees were small and grouped. In both cases supervision and spotting was done by contributed time.

Meals:

A total of 4145 meals were purchased for the laborers not including the spotters at 50 cents per meal or $2,072.50. The Government subsisted camp furnished a total of 625 meals, 60 of which are charged to supervision leaving a total of 565 meals at a cost of $0.434 cents per meal. Total cost of subsistence, $2,312.99.

Results:

At this early date it is an impossibility to forecast the effectiveness of the 1927 control work. Most of the larger centers of infestation were practically cleaned up with the exception of the Big Elk Park area. Here over 60% of the land is privately owned and no cooperation could be obtained so the area was left untouched.

The evening of June 30 found the Storm Mountain, Cedar Park, Crozier Mountain, Dry St. Vrain and Lakewood areas cleaned up. Two small drainages on the south side of the Big Thompson river near Drake, Colorado were also 100% covered. It was with regret that a number of small areas near Glen Haven were not cleaned of Beetle trees. These areas were practically all privately owned and control work had been purposely done on Government land first in hopes that the private owners would cooperate before July 1. This practice did have the effect of inducing the Glen Haven Resort Company to treat 100 infested trees on their property.

The Muggins Gulch crews treated most of the accessible groups but had to leave considerable area untouched farther back from the road.

The Riverside crews cleaned out all the country accessible from that camp. They were to have been moved to the Cabin Creek area at the west entrance into Big Elk Park.

During the early part of the project considerable pressure from the Boulder vicinity was brought to bear for control work in the Boulder region. Early in June an examination of the country near Nederland disclosed a serious infestation near Lakewood and on the southwest side of Sugarloaf Mountain. In conference with Dr. Blackman it was decided to put not more than two control crews at work here for the remainder of the project. It was felt that the money spent would give considerable returns, not only from a public relations standpoint but also in effective control work. Considerable publicity was given this work by the Boulder newspapers and 577 trees were treated in this vicinity. (Map areas, #1 and 2).

Aside from actual control work, the project was exceptionally good publicity matter. - It was well taken by the public and received considerable publicity thru all the local newspapers. It showed the local people that the Service not only protected the forests from fire but other enemies as well and that we were actually doing something.

It is estimated that approximately 75% of the seriously infested region was covered in this years project.

Recommendations:

From all indications it appears now that control work will be necessary in 1928. Dr. Blackman in his preliminary studies in the Big Elk Park region finds that this will most likely be the case. He has found that the infested trees have an average brood of 34 per square foot of surface. His studies elsewhere have shown that an emergence of 20 beetles per square foot is necessary for the Beetle to hold its own. Not allowing for any mortality prior to emergence this would indicate a possible 170% increase. 1:1.7

Next year it will be necessary to plan for placing Government subsisted camps farther back from the roads as most of the easily accessible areas were covered this year. It will probably be advisable to have this years areas again covered by pickup crews next year.

The project will probably not be any smaller next year. With more Government mess camps and covering less accessible country, more supervision may be necessary. Also it appears that the work will be more widespread as indications in the Poudre country indicate the commencement of an epidemic there. An examination this fall will be made of the entire yellow pine region and the District Rangers will be on the lookout for new Beetle work during the summer and fall.

No change in crew organization is desirable. A three-man crew was found to work the best. Crews of two to five men were tried out and the three-man crew gave the greatest output in treated trees per man.

The spotter can handle 2 to 3 crews depending upon the topography and timber.

The forms used were found sufficient in detail for the use to be made of the data. One change is recommended and that is a space for showing the average D. B. H. and average length treated for each days work on the Weekly summary sheet. This will give a little more basis for comparison of the various crews output.

Final Recommendations on next years work will be made at the close of this fall's field examination.

Respectfully submitted,

ARTHUR L. NELSON,
Forest Examiner.

Approved: July , 1927.

Forest Supervisor.

5-Insect Control
Colorado 1927

Areas treated 1927

#1. ... 292 Trees treated
2. .. 385 "
3. ... 1210 "
4. .. 1293 "
5. .. 1907 "
6. .. 668 "
7. .. 1480 "
8. ... 1610 "

7/10/27

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
W. B. GREELEY, FORESTER

COLORADO NATIONAL FOREST COLORADO

SIXTH PRINCIPAL MERIDIAN

1924

Scale
1 1/2 0 1 2 3 4 5 Miles

LEGEND

- National Forest Boundary
- Adjacent National Forest Boundary
- Road, fair or good
- Road, minor or very poor
- Trail
- Railroad
- Supervisor's headquarters
- Ranger station
- Triangulation station
- House, cabin, or other building

at District Office, Denver, 1923-1924
G. S., G. L. O., Forest Service, and
eys
urgess and Viggo Christensen
Viggo Christensen, 1924

Polyconic projection
North American datum

Longitude west from Greenwich

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